Educational Technology Standard Articulated by Grade Level

INTRODUCTION

In order to ensure that all students have the skills and capacity to solve the complex problems facing society today and in the future, this Educational Technology Standard guides efforts to enhance student learning through the integration of technology and academics. It also provides a framework that supports the learning process.

Organizations such as the Partnership for 21st Century Skills, the American Library Association, and International Society for Technology in Education have identified the skills and habits of the mind that students need to thrive in the new economy and solve the complex problems facing our society. Research in cognitive science is finding that the ability of a learner to demonstrate these skills is enhanced by the use of existing and emerging technologies.

The Educational Technology Standard committee, in revising the technology standards developed in 1998, has recognized this shift from technology being a supplemental topic, taught only in the computer lab, to technology supporting all learning. Keeping this shift in mind, the standard and the accompanying performance objectives have been written with the intention that they be taught within the content standards and they should not be considered as isolated standards to be taught in a vacuum.

"Teachers must become comfortable as co-learners with their students and with colleagues around the world. Today it is less about *staying ahead* and more about *moving ahead* as members of dynamic learning communities. The digital-age teaching professional must demonstrate a vision of technology infusion and develop the technology skills of others. These are the hallmarks of the new education leader." *Don Knezek, ISTE CEO, 2008*

The need for students to understand and use a variety of digital strategies in multiple contextual situations has never been greater. The use of multiple technologies continues to increase in all aspects of everyday life, in the workplace, in scientific and technical communities. Today's changing world will offer enhanced opportunities and options for those who thoroughly understand and are able to use technology effectively. The Arizona Technology Standard Articulated by Grade Level is intended to facilitate this vision.

RATIONALE

The use of technology is altering the way that teachers are teaching and students are learning. Arizona students must have regular opportunities to use these tools to develop skills that encourage creativity and innovation, communication and collaboration, research and information fluency, critical thinking, problem solving and decision making, digital citizenship, and personal productivity in the classroom and in daily life. Once these skills are obtained, students will be on the road to becoming lifelong learners and contributing members of a global technological society.

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METHODOLOGY

Work teams representing populations from around the state were formed. These groupings were comprised of large and small schools, rural and urban schools, and were ethnically diverse. The work team members consisted of classroom teachers, curriculum directors, educational technology teacher leaders, Career and Technical Education teachers, second-career teachers, librarians, and university college faculty. The goal was to revise and articulate the Educational Technology Standard K-12.

The Educational Technology revision teams utilized research and guidance from national organizations/resources such as the International Society for Technology Educators (ISTE), International Technology Education Association (ITEA), enGauge - North Central Regional Educational Laboratory, The Partnership for 21st Century Skills, American Association of School Libraries (AASL), the National Forum for Information Literacy, and other states' frameworks were used as guiding documents. Then the committee looked at the current Arizona Educational Technology Standards, adopted in 2000, to determine whether or not the committee should update the standards or consider a total revision. Based upon the research and the changes in educational technology, the committee decided to rewrite the educational technology standards and began articulating and defining by grade level, the concepts and performance objectives for kindergarten through high school.

The revision grade level teams created draft documents with performance objectives articulated to the appropriate grade levels. The draft was available for public comment in the fall of 2008. Stakeholders commented on the draft via email, an online survey and during face-to-face Public Comment Sessions. Once the comment period was closed the teams and smaller sub-committees of teams refined the draft documents based on clarity, cohesiveness, and comprehensiveness. Reasonableness, usefulness, and appropriateness were key guidelines for the articulation process. The measurability of each performance objective was also a consideration.

ORGANIZATION OF THE EDUCATIONAL TECHNOLOGY STANDARD

The Educational Technology Standard Articulated by Grade Level is divided into six main strands:

- Creativity and Innovation
- Communication and Collaboration
- Research and Information Literacy
- Critical Thinking, Problem Solving and Decision Making
- Digital Citizenship
- Technology Operations and Concepts

Each strand is divided into concepts that broadly define the skills and knowledge that students are expected to know and be able to do. Under each concept are performance objectives (POs) that more specifically delineate the ideas to be taught and learned.

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The comprehensive document (PreK-High School) is designed so that teachers can read the performance objectives across grade levels to incorporate learning from previous, current, and future grade levels. The standard is separated into two separate documents. The first document spans grade levels PreK through 6, and the second document covers grades 7 through High School. Viewing the Educational Technology Standard document from left to right helps the teacher to see the educational technology continuum across the grade levels. Every effort was made to eliminate repetitions. The intent was to build on the learning in previous grade levels, connect important ideas, and highlight new content each year. This coherency supports students in developing new understandings and skills. Looking down each individual column enables a teacher to see the performance objectives that students are expected to know and be able to do at any grade level.

This organization does not imply that the teaching and learning of the educational technology standard should be fragmented or compartmentalized. Educational technology is a highly interconnected discipline; ideas from all six strands need to be continuously integrated as needed to make meaning and connections to other content areas, concepts and performance objectives. In each grade level document (Resource Guide), these connections are highlighted.

The order of the strands, concepts, and performance objectives (POs) in the Educational Technology Standard document are not intended to be a checklist for instruction. Concepts develop with a spiraling of ideas/skills that are interconnected and dependent on each other, and this is reflected in the standard document. Effective instruction often incorporates several performance objectives into an integrated experience of learning for the student.

New to the 2009 Educational Technology Standard is the development of more comprehensive grade level documents (Resource Guide). The format of these documents will support the implementation of the revised standard. After each concept statement, there are summary expectations appropriate for that specific grade level. These statements provide a roadmap for instruction. Teachers will notice that there are now three columns of information. The first column lists the performance objectives with accompanying strand/concept and content area connections. The middle column provides explanation for the performance objectives. The third column provides instructional support to teachers in the form of examples.

Strand 1: Creativity and Innovation

This strand requires that students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

Concept 1: Knowledge and Ideas

Use technology to generate knowledge and new ideas.

Concept 2: Models and Simulations

Use digital models and simulations to examine real-world connections, explore complex systems and issues, and enhance understanding.

Concept 3: Trends and Possibilities

Use technology to forecast trends and possibilities.

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Concept 4: Original Works
Use technology to create original works in innovative ways.

Strand 2: Communication and Collaboration

This strand requires students to use digital media and environments to communicate and collaborate with others.

Concept 1: Effective Communications and Digital Interactions
Communicate and collaborate with others employing a variety of digital environments and media.

Concept 2: Digital Solutions
Contribute to project teams to produce original works or solve problems.

Concept 3: Global Connections
Create cultural understanding and global awareness by interacting with learners of other cultures.

Strand 3: Research and Information Literacy

This strand requires that students apply digital tools to gather, evaluate, and use information.

Concept 1: Planning
Plan strategies to guide inquiry.

Concept 2: Processing
Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

Strand 4: Critical Thinking, Problem Solving, and Decision Making

This strand requires students to use critical thinking, problem solving, and decision making to manage projects using digital tools and resources.

Concept 1: Investigation
Identify and define authentic problems and significant questions for investigations.

Concept 2: Exploring Solutions
Plan and manage activities to develop solutions to answer a question or complete a project.

Strand 5: Digital Citizenship

This strand requires students to understand human, cultural, and societal issues related to technology practice and ethical behavior.

Concept 1: Safety and Ethics
Advocate and practice safe, legal, and responsible use of information and technology.

Concept 2: Leadership for Digital Citizenship
Demonstrate leadership for digital citizenship.

Concept 3: Impact of Technology
Develop an understanding of cultural, historical, economic and political impact of technology on individuals and society.

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Strand 6: Technology Operations and Concepts

This strand requires students to demonstrate a sound understanding of technology concepts, systems, and operations.

Concept 1: Understanding
Recognize, define and use technology processes, systems, and applications.

Concept 2: Applications
Select and use applications effectively and productively.

Concept 3: Problem Solving
Define problems and investigate solutions in systems and processes.

Concept 4: Transfer of Knowledge
Transfer current knowledge to learning of new technologies.